

A NEW GALAXY
of semiconductor memory products...

from Signal Galaxies

Focus First on This Ready-to-Plug-in MOS Memory Card—73,728 Bits for Just Pennies a Bit

Featuring...

MOS Memory Card

- 73,728 bits of low-cost MOS memory per card
- Self-contained address decoding and data registers, refresh and timing circuits
- 4K x 18, 4K x 16, 8K x 9, or 8K x 8 configurations
- TTL tri-state output registers for easy expansion
- Manufacturing rights with delivery of 200th card

Small MOS Memory System

- Self-contained power supply and memory tester options
- Capacity to 147,456 bits in convenient configurations from 4K to 16K
- Compact design

Large MOS Memory System

- Self-contained power supply and memory tester options
- Capacity up to 589,824 bits
- Convenient configurations up to 16K x 36 or 32K x 18

Complete Memory on One Card

Ready-to-plug-in means that you need only a card slot, dc voltages, address, data, and read-write control signals. The memory card contains everything else, including the memory array, address decoding circuits, data input and output registers, and control circuits for interface and refresh timing. And it's all compactly packaged on an 11.5 x 13.7 inch printed circuit board. Other physical board sizes are available on request.

Convenient Configurations

The memory card is available in four standard configurations of commonly used word sizes:

Word Capacity	Word Size	Total Bit Capacity
4096	18 bits	73,728
4096	16 bits	65,536
8192	9 bits	73,728
8192	8 bits	65,536

All configurations feature full-cycle read or write operation and split-cycle read-modify-write operation. In the 16- and 18-bit word configurations, all operations can be performed on 8-bit bytes as well as full memory words.

Easy Expansion

Expansion to larger word capacities and word sizes is simplified by the tri-state output logic used on each card. Several cards can be easily combined into expanded configurations by appropriate Or-tying at the connector wiring.

OEM Extra!

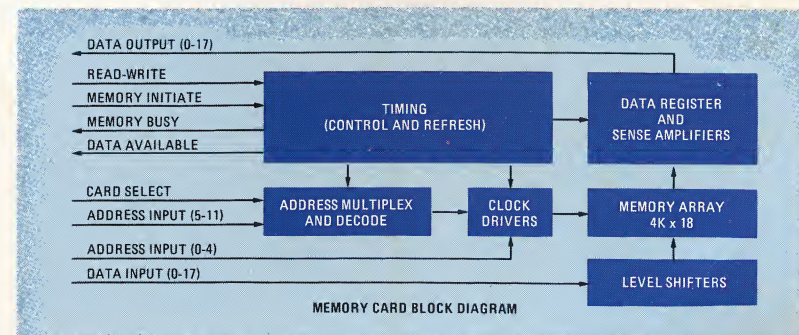
With delivery of your 200th card, you'll also receive full manufacturing rights. We'll pass along the design data—art work, drawings, test procedures, and vendor lists—you need to get into production. Take advantage of this offer to keep design and development costs down and lead time short.

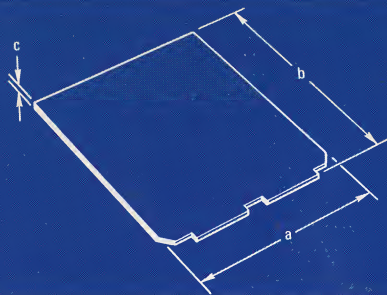
Technical Details

The memory card contains an array of up to 72 MOS random access memory chips (1024 bits per chip) plus IC and discrete

components for the supporting address, data, and timing circuits. The timing circuit handles both interface and refresh timing. Refresh intervals are timed by a single-phase clock generated by a stable frequency oscillator. Thirty-two memory cells in each memory chip are refreshed every 64 microseconds. Refreshing does not interrupt memory cycles in progress, nor does it restrict state changes of the address lines.

The data input lines to the memory card are strobed during an extremely narrow time window to minimize power dissipation within the memory chips. The data output lines are fed from TTL tri-state output registers. Twelve input address lines are used for addressing 4096 memory words; a 13th line is used for addressing 8192 half words, or bytes.



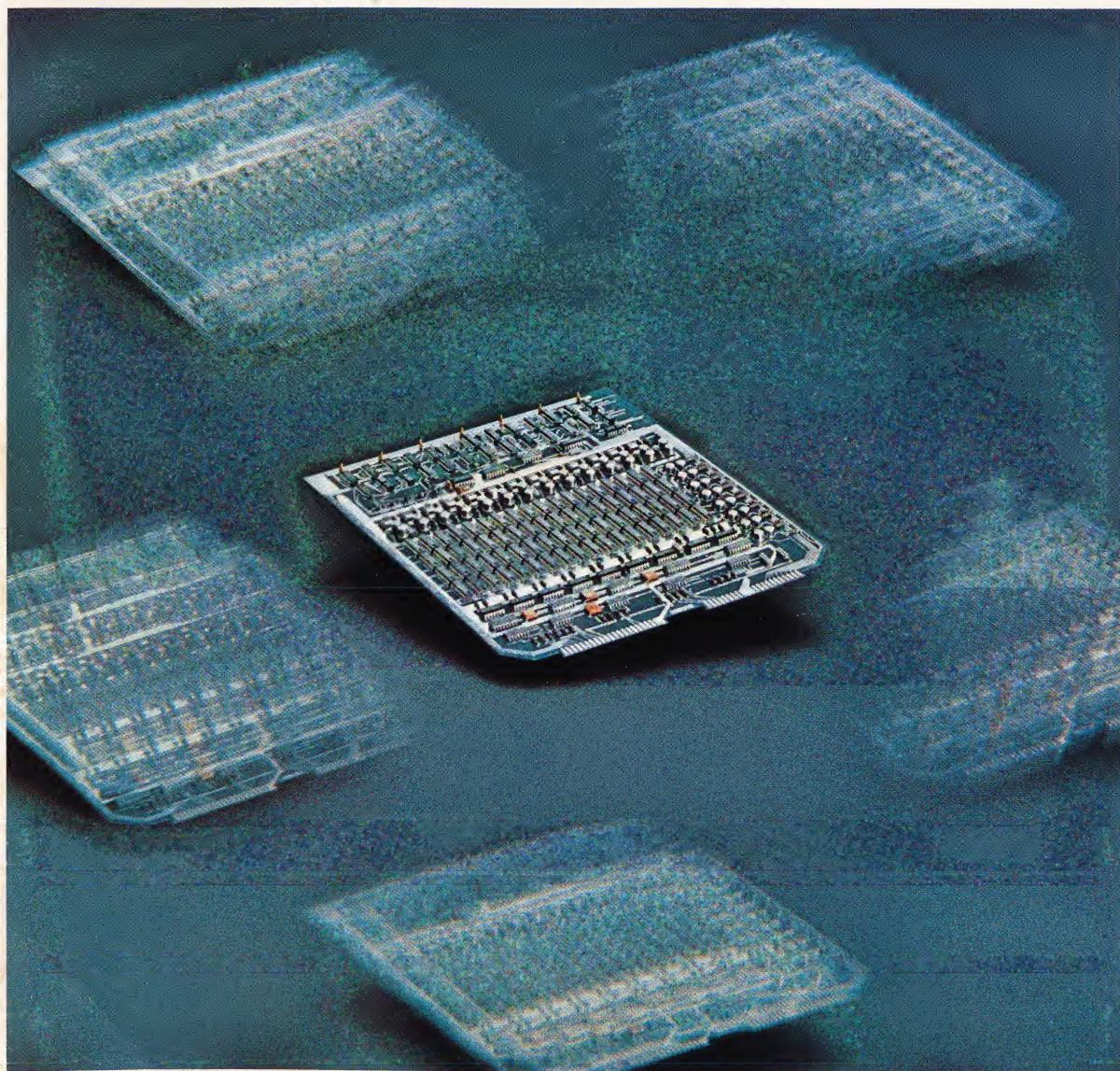


DIMENSIONS
(in inches)

a	b	c
11.5	13.7	0.6
11.5	15.0*	0.6

*with dc-to-dc converter

MOS Memory Card



Then, Explore the Possibilities of This Basic System—One or Two Memory Cards With Optional Self-Contained Power Supply and Tester

As a Complete MOS Memory System

This basic system occupies just 3½ inches of rack space, yet offers endless possibilities in applications requiring low-cost, small capacity memory and flexible design. The compact chassis accommodates one or two memory cards, plus optional memory tester card, test panel, and power supply. All major assemblies are removable from the front of the chassis.

Memory capacity and word size depend on the number of memory cards and the back panel wiring patterns. Most common configurations are available, ranging from 4K x 18 or 8K x 9 with one memory card to 4K x 36, 8K x 18, 16K x 9, or 16K x 8 with two memory cards.

The optional tester provides a complete facility for checking and exercising the system. The tester operates in three basic modes, selectable from the front panel:

On Line—normal operation.

Test—for setting up checkerboard, refresh, unique data pattern, walking ones, all ones, or all zeros tests.

Manual—for setting up address and data patterns through the front panel LED pushbutton indicators.

As a Special Memory-Oriented System

Forgo the memory tester and you can convert the memory system into a special-purpose controller, a minicomputer, or any number of other special memory-oriented systems. You can use the space normally occupied by the tester card for your own custom-designed logic card. And you can use the blank panel, supplied in place of the tester panel, as the control panel for your special system.

To speed you along the way to your special system, we've even designed a "Do Your Own Thing PC Board" for your custom-

designed circuits. It has 140 IC sockets that will accept 14- or 16-pin dual inline packages. After you've designed your logic, just send us your logic wire lists. We'll wirewrap the board to your specifications so that it's ready for you to plug in your IC's.

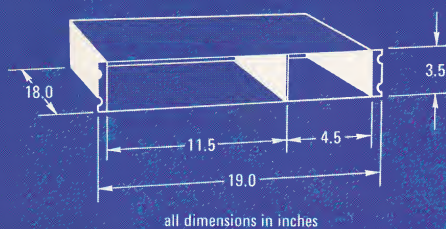
We've even thought of something special when it comes time to checking out your custom card. You can do it with the card installed in the system. Simply remove the bottom chassis panel for access to the wirewrap pins on the circuit board. When you're all checked out, replace the panel and you're ready for operation.

Standard Configurations

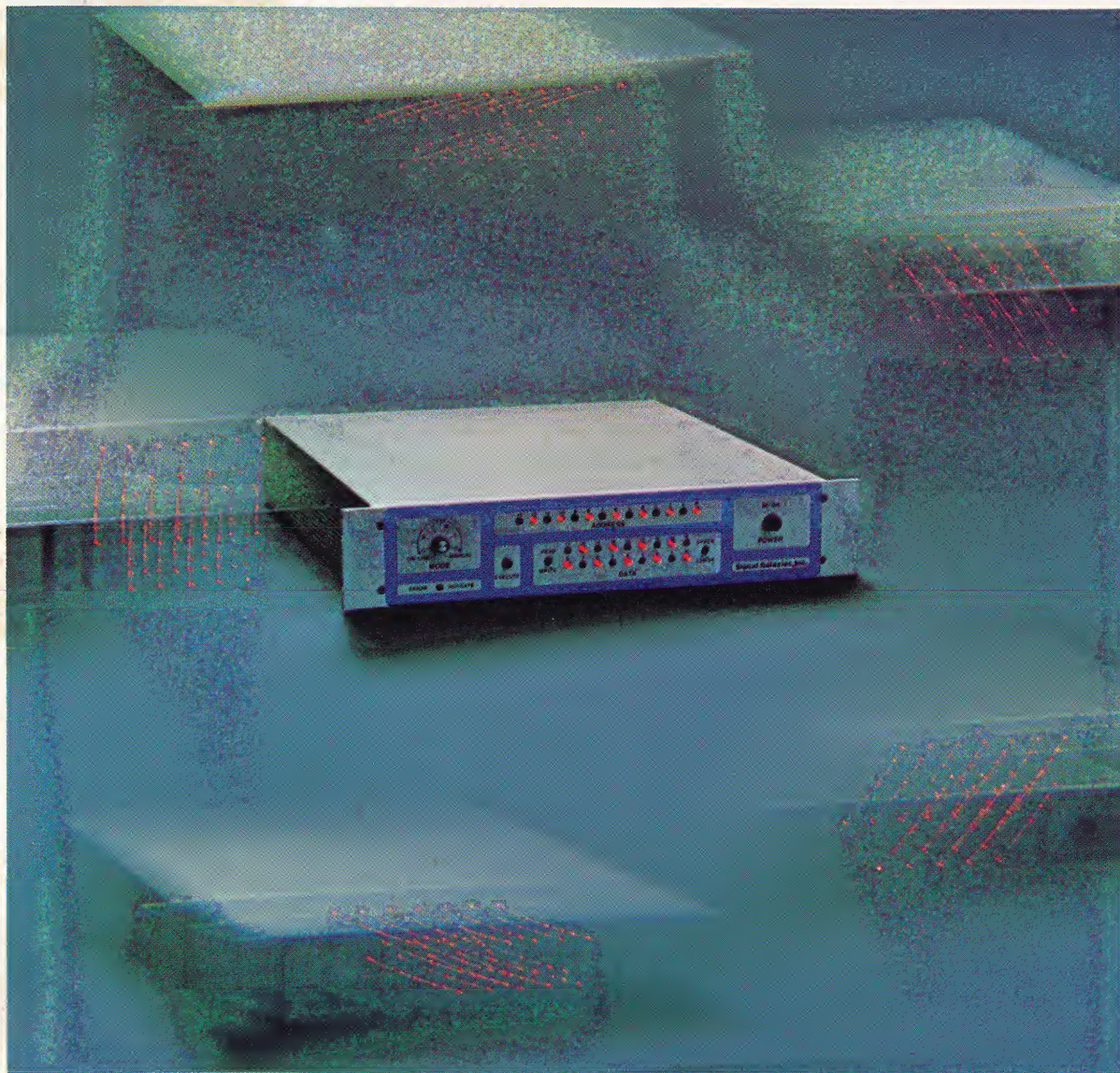
Scan the table below for the memory configuration that fits your application. If you don't see it, turn the page for more.

Word Capacity	Word Size	Total Bit Capacity	Memory Cards	Spare Memory Slot*	Tester Card
4,096	18 bits	73,728	1	1	1
4,096	16 bits	65,536	1	1	1
8,192	9 bits	73,728	1	1	1
8,192	8 bits	65,536	1	1	1
4,096	36 bits	147,456	2	0	1
4,096	32 bits	131,072	2	0	1
8,192	18 bits	147,456	2	0	1
8,192	16 bits	131,072	2	0	1
16,384	9 bits	147,456	2	0	1
16,384	8 bits	131,072	2	0	1

*Can be used for bus-compatible read-only memory cards.



Small Memory System



Finally, Discover the Value of This Flexible Large - Capacity System—Up to 8 Memory Cards With Optional Self-Contained Power Supply and Tester

This large-capacity system picks up where the basic system leaves off, in both size and flexibility. It can accommodate as many as 8 MOS memory cards plus an option card, and has the same self-contained power supply and memory tester option features as the basic system. And like the basic system, all major assemblies are removable from the front. If you don't see your system listed at the right, talk to our salesman—he may surprise you.

Word Capacity	Word Size	Total Bit Capacity	Memory Cards	Spare Memory Slots*	Option Card	Tester Card
16,384	18 bits	294,912	4	4	1	1
16,384	16 bits	262,144	4	4	1	1
8,192	36 bits	294,912	4	4	1	1
8,192	32 bits	262,144	4	4	1	1
24,576	18 bits	442,368	6	2	1	1
24,576	16 bits	393,216	6	2	1	1
12,288	36 bits	442,368	6	2	1	1
12,288	32 bits	393,216	6	2	1	1
32,768	18 bits	589,824	8	0	1	1
32,768	16 bits	524,288	8	0	1	1
16,384	36 bits	589,824	8	0	1	1
16,384	32 bits	524,288	8	0	1	1

*Can be used for bus-compatible read-only memory cards.

Keeping the Galaxy Spinning

Fast Replacement—Factory Repair

Our customer service representatives, located throughout the country, have been selected and supplied to give you service when and where you need it. Each representative carries a full line of replacement memory cards, and each is on call to replace faulty cards and return them to the factory for repair. After they've been repaired and checked out by factory personnel, he'll replace

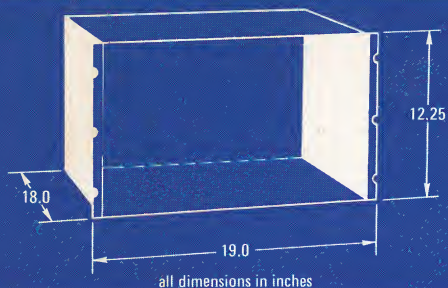
them in your system. Or if you prefer, you can make arrangements to deal directly with the factory. In either case you'll get fast, efficient service.

At the Galaxy's Center

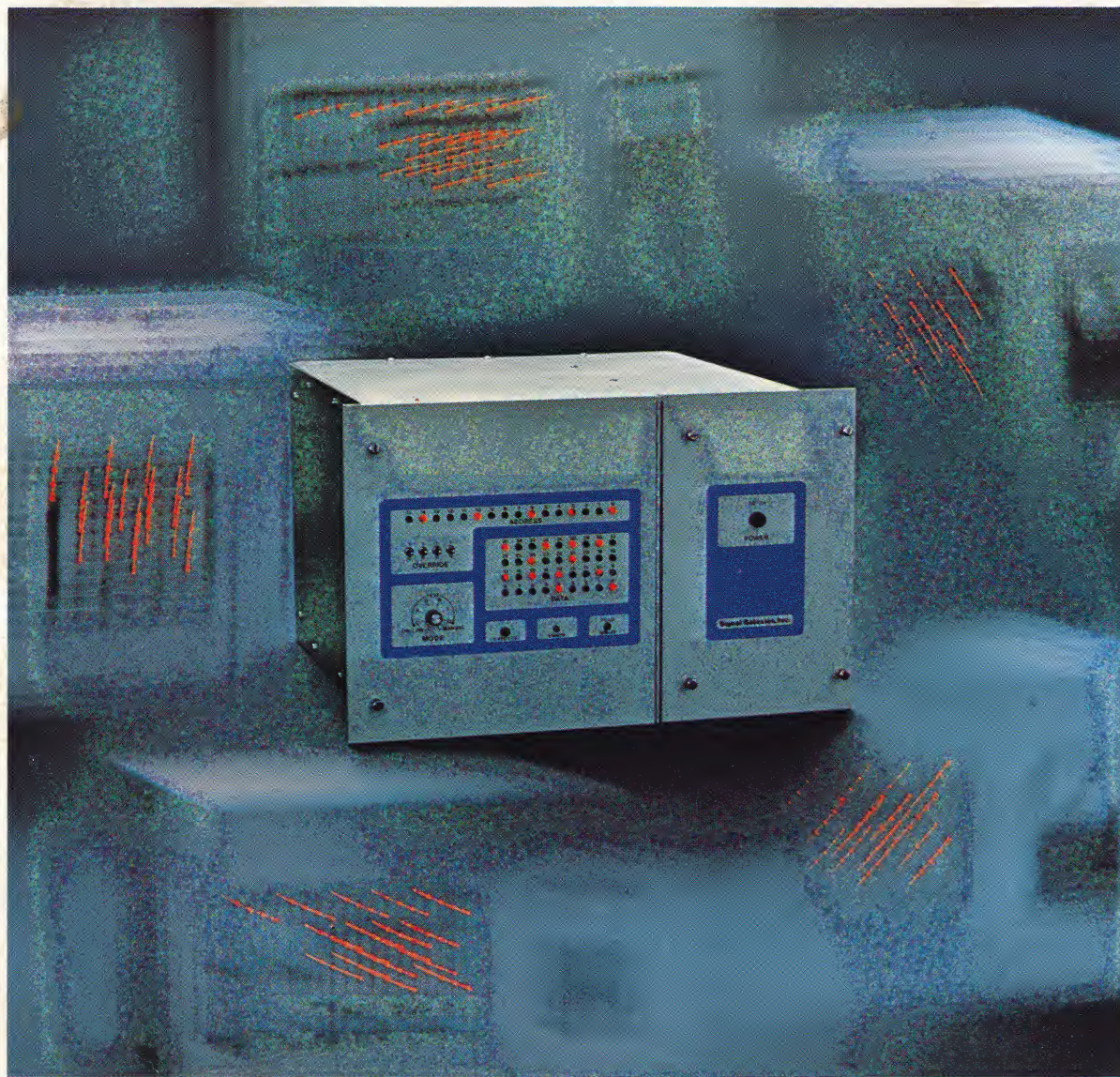
Signal Galaxies was founded in early 1969 on the basis of a unique technical concept called *flux ring*: a batch fabrication technique for magnetic memory elements. In August 1970, the

company moved from its original facilities in Northridge, California to larger facilities in Van Nuys, California.

Foreseeing the importance of semiconductor memories in the Memory Industry of the 70's, Signal Galaxies, in January 1971, moved into the semiconductor memory market with the development of low-cost, MOS random access memories.



Large Memory System



Specifications

Operating Mode

Full cycle
Split cycle

Read or write
Read followed by write

Word Control

Full word
Bytes

16 or 18 bits
8- or 9-bit byte selected
by mode control lines

Access

Random address

Cycle Time

Read
Write
Read-modify-write

650 nanoseconds
650 nanoseconds
800 nanoseconds (plus
modify time)

Access Time

500 nanoseconds

Maximum Capacity Per Card

4096 words x 18 bits

Maximum Capacity Per System

32,768 words x 18 bits, or
16,384 words x 36 bits

Input/Output Logic Levels

TTL compatible

Power Requirements (per card)

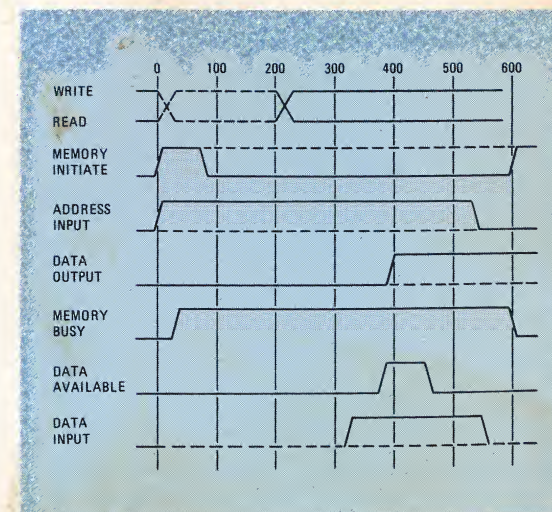
Cards with dc to dc converter

DC1 +5 volts @ 2.5 amperes
DC2 +16 volts @ 0.9 ampere

Cards without dc to dc converter

DC1 +5 volts @ 2.0 amperes
DC2 +16 volts @ 0.9 ampere
DC3 +19 volts @ 0.1 ampere
DC4 -6 volts @ 0.6 ampere

System Timing



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